

REMARKS/ARGUMENTS

Claims 1-35 are pending in the application. The Applicant hereby requests further examination and reconsideration of the application in view of these remarks.

In paragraph 2, the Examiner rejected claims 1-3, 5, 10-15, 17, and 22-25 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,561,647 ("Kayanuma") in view of U.S. Patent No. 6,016,379 ("Bulow").

For the following reasons, the Applicant submits that claims 1-3, 5, 10-15, 17, and 22-25 are allowable over Kayanuma and Bulow.

Kayanuma discloses a system for detection of signals read out from an optical disc (col. 1, lines 6-10). The system of Kayanuma comprises an optical disc, an optical head, an equalizer, a maximum-likelihood sequence detection circuit, and a controller (col. 2, lines 17-35). The optical disc is for storing information in accordance with run-length limited codes having no fewer than two minimum intervals of transition (*Id.*). The optical head is for reading a signal from the optical disc (*Id.*). The equalizer is for equalizing the signal read from the optical disc (*Id.*). The maximum-likelihood sequence detection circuit is for detecting a signal sequence to be supplied to an output terminal (*Id.*). The signal sequence is selected from signal sequences meeting a predetermined state transition regularity and is the sequence most coincident to the signal equalized in the equalizer (*Id.*). The controller is for controlling the equalizer to equalize the signal read from the optical disc, only when an error signal is detected in a vicinity of an end of a region having a code transition interval of more than a predetermined number (*Id.*).

Bulow discloses an electrical equalizer and equalization method for an electric input signal that is derived from an optical signal that has been transmitted over an optical fiber and is distorted due to interference in the optical signal (Abst.; col. 1, lines 9-15). The method of Bulow comprises determining the quality of the distorted output signal, determining at least one set of equalization parameters as a function of at least two arbitrarily assumed interference parameters which characterize the interference from which the distortion results, with the number of interference parameters being less than the number of equalization parameters of the at least one set, and then varying the interference parameters, and thus the equalization parameters of the at least one set, until the quality of the equalized output signal is optimized (col. 2, lines 9-19).

Claim 1 recites "an apparatus for applying compensation to samples received from an optical channel comprising at least one optical fiber" (emphasis supplied). The apparatus comprises, *inter alia*, "an error generator generating an error for a current sample based on the difference between 1) an equalized current sample and 2) a decision for the current sample adjusted for a target response, wherein the target response is based on a response of the at least one optical fiber" (emphasis supplied). The Examiner acknowledges on page 3 of the Action that "Kayanuma does not specifically disclose that the optical signal is received through an optical fiber."

The Examiner cites Bulow as teaching that signals passing through a single-mode fiber may experience distortions from differential group delay and the use of an equalizer to compensate for such distortion, concluding that "it would have been obvious to a person of ordinary skill in the art to use the compensation system and method disclosed by Kayanuma in the receiving end of an optical communication system such as taught by Bulow in order to use the system to correct errors in signals that had been transmitted over fiber."

Kayanuma is Non-Analogous Art

As discussed above, the teachings of Kayanuma are limited to the readout of signals from optical discs. Kayanuma makes no mention of optical fibers and does not teach, disclose, or suggest that a decision for a current sample be adjusted for a target response that is based on the response of an optical fiber. To the contrary, the present invention is directed to the equalization of signals received via optical fibers. Thus, Kayanuma is non-analogous art, and a skilled person concerned with the equalization of an electric signal derived from an optical signal transmitted over an optical fiber, as in the case of Bulow, would not have turned to Kayanuma for guidance. Nor would a skilled person concerned with the equalization of an electric signal derived from an optical disc in an optical information storage and retrieval system, as in Kayanuma, look to Bulow for guidance.

The Applicant submits that one skilled in the art of optical communications via optical fibers would not look to the field of optical information storage and retrieval, as suggested by the Examiner. Kayanuma's system for detecting readout signals is concerned with non-linear distortion occurring in a digital recording system for an optical disc, which is caused by overlapping of recording pits (e.g., as shown in FIG. 2 of Kayanuma) (Kayanuma at col. 3, lines 56-67; col. 6, lines 18-20). Being an optical-disc readout-signal-detection system, Kayanuma is not concerned with Polarization Mode Dispersion (PMD), a phenomenon that occurs in single-mode fibers and manifests itself in a two-way propagation of an optical signal (Bulow at col. 1, lines 22-37). As explained in Bulow, if a fiber exhibits birefringence, i.e., different propagation conditions for the two orthogonal directions of polarization (principal axes), then the fundamental mode is split into two modes polarized in mutually perpendicular planes (*Id.*). Along these two principal axes of the fiber, the optical signal propagates at different group velocities, i.e., a "fast" signal component and a "slow" signal component results (*Id.*). The PMD can be sufficiently characterized as a function of two quantities, e.g., by the time difference between the "fast" and "slow" signal components and by the relative power in one of the principal axes (*Id.*). In connection with very-high-bit-rate optical transmission on optical fibers (>2.5 Gb/s), PMD may occur as a property that limits the transmission rate (maximum transmission distance) (*Id.*).

Moreover, a simple comparison of the search fields of Kayanuma (Class 360: Dynamic Magnetic Information Storage or Retrieval and Class 369: Dynamic Information Storage or Retrieval) with the search fields of Bulow (Class 385: Optical Waveguides and Class 359: Optical Systems and Elements) and the search field from the Examiner's own searches in the present invention (Class 375: Pulse Or Digital Communications) clearly shows how far afield Kayanuma truly is.

Being non-analogous art, Kayanuma and Bulow cannot properly be combined to render obvious any of the Applicant's claims.

There is No Suggestion to Combine Kayanuma and Bulow

A modification and/or combination of reference teachings is improper unless the prior art suggests such a modification or combination. See, e.g., In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990) (the PTO erred in rejecting the claimed invention as an obvious combination of the teachings of two prior art references when the prior art provided no teaching, suggestion or incentive supporting the combination); Smithkline Diagnostics, Inc. v. Helena Laboratories Corp., 859 F.2d 878, 887, 8 USPQ2d 1468, 1475 (Fed. Cir. 1988) (a challenger to the validity of a patent "cannot pick and choose among the individual elements of assorted prior art references to create the claimed invention."; the challenger "has the burden to show some teaching or suggestion in the references to support their use in the particular claimed combination."); In re Mills, 916 F.2d 680, 682, 16 USPQ2d 1430, 1432 (Fed. Cir. 1990)

(although a prior art device “may be capable of being modified to run the way [the patent applicant’s] apparatus is claimed, there must be a suggestion or motivation in the reference to do so.”); In re Laskowski, 871 F.2d 115, 117, 10 USPQ2d 1397, 1398 (Fed. Cir. 1989) (“Although the Commissioner suggests that [the structure in the primary prior art reference] could readily be modified to form the [claimed] structure, “[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.””).

Kayanuma contains no suggestion that its teachings would be desirably applied to the equalization of signals received via optical fibers. Likewise, Bulow contains no suggestion that a combination with optical-disc-related teachings would be desirable. In fact, the Examiner cites Bulow solely for (i) the teaching that “signals passing through a fiber may experience undesired distortion and require compensation,” (ii) the teaching that “signals passing through a single mode fiber may experience distortions from differential group delay,” and (iii) the use of “an equalizer in the receiving end to compensate for this distortion.” The Examiner subsequently concludes that it would have been obvious to a person of ordinary skill in the art to use the compensation system and method disclosed by Kayanuma “with optical fiber communications such as taught by Bulow in order to correct distortion and errors in signals that had been transmitted over fiber,” and “in the receiving end of an optical communication system such as taught by Bulow in order to use the system to correct errors in signals that had been transmitted over fiber” (Action, pp. 3-4). Bulow, in fact, contains no suggestion to support these conclusions of purported obviousness. Bulow merely states the problem of distortion in optical fiber transmissions and discloses the use of an equalizer as part of the solution.

Nor does the Examiner supply any other prior art that suggests the desirability of combining Kayanuma and Bulow.

Since neither Kayanuma nor Bulow, nor any other prior art cited by the Examiner, contains a suggestion of desirability of combining these references to arrive at the present invention, Kayanuma and Bulow cannot properly be combined to render obvious any of the Applicant’s claims.

The Examiner Has Improperly Used Hindsight

If the prior art does not contain even a suggestion of the specific modifications that are needed to be made to the teachings of the prior art to yield the claimed invention, then a rejection on the grounds of obviousness based solely on the advantages provided by that claimed invention is an improper use of hindsight. See, e.g., In re Fritch, 972, F.2d 1260, 1266, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992) (“[I]t is impermissible to use the claimed invention as an instruction manual or ‘template’ to piece together the teachings of the prior art so that the claimed invention is rendered obvious . . . This court has previously stated that ‘[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.’”); Texas Instruments Inc. v. U.S. Int’l Trade Comm’n, 988 F.2d 1165, 1178, 26 USPQ2d 1018, 1029 (Fed. Cir. 1993) (“Absent . . . [a] suggestion to combine the references, respondents can do no more than piece the invention together using the patented invention as a template. Such hindsight reasoning is impermissible.”); In re Gorman, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991) (“As in all determinations under 35 U.S.C. section 103, the decisionmaker must bring judgment to bear. It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant’s structure as a template and selecting elements from references to fill the gaps.”); Symbol Technologies Inc. v. Opticon Inc., 17 USPQ2d 1737, 1746 (S.D.N.Y. 1990), aff’d, 935 F.2d 1569, 19 USPQ2d 1241 (Fed. Cir. 1991) (“That a technician, in hindsight, could combine elements known within the technology to produce the contested patent does not make the patent obvious to one skilled in the art at the time the patent was issued.”); In re Dow Chemical

Co., 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988) ("The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this process should be carried out and would have a reasonable likelihood of success, viewed in light of the prior art . . . Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure."); In re Stencel, 828 F.2d 751, 755, 4 USPQ2d 1071, 1073 (Fed. Cir. 1987) (obviousness cannot be established "by combining the teaching of the prior art to produce the claimed invention, absent some teaching or suggestion that the combination be made.").

Clearly, in combining Kayanuma and Bulow, the Examiner has used the disclosure of Applicant's own invention to cherry-pick components from each of these two references and then combine them to make out a case for obviousness, while ignoring the fact that one skilled in the art of equalizing an electric signal derived from an optical signal transmitted over an optical fiber, as in the case of Bulow, would not have turned to Kayanuma for guidance. It is submitted that one skilled in the art would not think to modify and combine the references in the manner suggested by the Examiner, since there is neither a teaching or suggestion in either reference to lead one to make the combination, and making the combination necessarily means combining non-analogous references from separate fields of endeavor. Thus, it is submitted the Examiner has applied impermissible hindsight and is applying the teachings of the present invention to the prior art to make out a case for obviousness.

For the foregoing reasons, the Applicant submits that claim 1 is allowable over Kayanuma in view of Bulow. For similar reasons, the Applicant submits that claims 13 and 25 are also allowable over Kayanuma in view of Bulow. Since the remaining claims depend variously from claims 1 and 13, it is further submitted that those claims are also not rendered obvious by Kayanuma in view of Bulow. The Applicant submits therefore that the rejections of claims under § 103 have been overcome.


In paragraph 3, the Examiner indicated the allowance of claims 26-35.

In paragraph 4, the Examiner objected to claims 4, 6-9, 16, and 18-21 as being dependent upon a rejected base claim, but indicated that those claims would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims.

In view of the above remarks, the Applicant believes that the now-pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,

Date: 1/9/05
Customer No. 46900
Mendelsohn & Associates, P.C.
1500 John F. Kennedy Blvd., Suite 405
Philadelphia, Pennsylvania 19102



Kevin M. Drucker
Registration No. 47,537
Attorney for Applicant
(215) 557-6659 (phone)
(215) 557-8477 (fax)